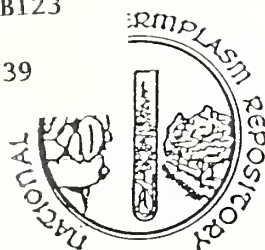


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NEWSLETTER

National Clonal Germplasm Repository
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Kim E. Hummer, Research Leader/Curator

January 1990

New Accessions

by Dr. Kim Hummer

We have added about 424 new accessions to the collection at the NCGR since last June. The largest group to come in was about 200 gooseberries from the National Fruit Collection, Brogdale Farm, Ministry of Agriculture, Fisheries and Food, Faversham, Kent, England. We look forward to receiving some additional pink currants, and black currants after appropriate quarantine at Beltsville, MD. We are very grateful to receive this collection understanding that Brogdale is undergoing financial difficulties at this time. We also received a number of *Ribes* from the Vineland Station, Agriculture Canada.

Dr. Jim Luby collected native *Fragaria* and other small fruits throughout the Northern Rocky Mountains this past summer. We received 55 new accessions from his effort thus far. We have received many older commercially unavailable cultivars from Thomas Merkle of Lehighton, Pennsylvania. North Star Gardens and several other nurseries have provided us with *Rubus* cultivars. Dr. H.E. Weber has sent us *Rubus* species seed from West Germany. Our Plant Pathologist, Joseph Postman, has provided 12 cultivars of *Corylus* and 30 *Fragaria* as virus negative clones for our collection.

We have just received congressional approval to purchase additional acreage for our field collections. We have begun investigating a 40 acre parcel that we hope to acquire during FY 90. This land will be a much needed addition to our present field collection of 20 acres.

Staffing Changes

In July we hired Mr. John Orlowsky as Biological Technician in charge of Plant Propagation. John has just finished his Master's degree in Plant Pathology from Oregon State University. We welcome his assistance in the maintenance of the screenhouse collections and in the distribution of plant requests. We have a Biological Aide position under recruitment. This position will

provide assistance in field collections and in physical plant maintenance. We hope to be hiring for this position within the next several months.

Dr. Norman James will be retiring on February 1, 1990, from about 27 years of service to USDA/ARS and 30 years to the Federal Government. He has been stationed here in Corvallis for a little over a year working on a special assignment for the National Program Staff. His paper on a survey of the public plant breeding programs of the United States in 1989 will be published in an upcoming "Diversity" issue. We have enjoyed his presence, appreciate his advice and counsel, and wish him the best in his upcoming retirement.

NCGR Staff

Dr. Kim Hummer, Research Leader/Curator
Dr. Francis Lawrence, Small Fruits
Dr. Barbara Reed, Cryopreservation
Dr. Henrietta Chambers, *Mentha*
Jim Chandler, Biological Technician
Bill Doerner, Integrated Pest Management
Donna Gerten, Information Manager
Mickey Hooton, Secretary
Carolyn Paynter, In Vitro Technician
Joseph Postman, Plant Pathologist
John Orlowsky, Greenhouse Manager
Joe Snead, Field Manager
Dr. Norman James, NPGS- Special Assignment
Dr. Mel Westwood, Collaborator
***Mentha* Collection**
by Dr. Henrietta Chambers

The *Mentha* collection has undergone many changes in 1989. Dr. Arthur Tucker, Mint Taxonomist, visited the repository in July and verified identities of our clonal accessions. He suggested germplasm that we should acquire to make our collection more complete. We lack species endemic to Australia, New Zealand, and Japan, and subspecies of *M. longifolia* from a wide geographic area (Europe, Asia, and Africa). Dr. Tucker, working with USDA Taxonomist, Dr. John Wiersma, in Beltsville, has helped solve some of our nomenclatural problems. Dr. Tucker presented a seminar to

the NCGR staff on a modern interpretation of the *M. x gracilis* complex, a hybrid (*spicata* x *arvensis*) species *M. cardiaca* (Scotch Mint) and *M. gentilis*, (Red Mint). His research includes chemical, morphological, cytological, and genetic (breeding) studies. He gave the repository a copy of his "Index Mentharum" (Copyright 1989), a list of *Mentha* in his collection, bibliographic citations, and other data on oil analysis and chromosome numbers.

Our *Mentha* literature collection has grown with the addition of early taxonomic literature, including the treatments by Linnaeus (1753), Hudson (1762, 1778-1798), Solé (1798), and many others. In addition, we continue to obtain reprints of current research papers. With the help of Dr. Al Haunold, Francis Lawrence, and Don Roberts, we have been able to work out the pedigree of 127 hybrids made by *Mentha* breeder Dr. M.J. Murray, whose collection is the nucleus of the NCGR mint collection.

Pycnanthemum

In our first full season with *Pycnanthemum* (mint relative) in the screenhouse, we have collected flowering vouchers and seeds when possible. Spontaneous seed production is very low for those species which require insect pollinators, however, some species are apomictic and can set abundant seed without pollination. We now have seed of these accessions.

Field Plantings

by Joe Snead

Another growing season has come to an end at the Corvallis repository. This fall we have had a considerable increase in accessions in our *Corylus* field. We are also working in cooperation with the Oregon State University Agricultural Experiment Station to establish a *Corylus* planting at the Southern Oregon Experiment Station in Medford. This is a back-up to our main collection in Corvallis. The repository is providing the plant materials and technical assistance. The land and maintenance are being provided by the Southern Oregon Experiment Station of

Oregon State University.

A new field for minor genera is being established at the repository. The acre size field will contain at least fourteen different genera and will be quite an interesting plant collection.

We also have one more new field collection. After several trips to the Bandon, Oregon, area we have established a cranberry field collection. Our planting is set up as a display area. Each accession is limited to a 3' x 5' area surrounded by a gravel walkway. We will be able to carry out many evaluations and work on identity verification. The planting will also be an attractive addition to our landscape.

The recruitment period has just closed for a new Biological Aide field position. By the end of January we should have a new field worker. This will be a welcome addition.

Looking to the future our *Pyrus* field will continue to change. We wish to establish a rootstock block with accessions on their own roots. This would enable us to send our root pieces for propagation to requesters. With Joseph Postman's virus elimination work, many of our infected *Pyrus* clones have been replaced with virus tested clones. This is enabling us to establish these in the field.

Our *Ribes* field will be expanding considerably in the coming year. Without additional land, we will change to double crop rows in this field.

Good luck to all of you and have a prosperous New Year!

GRIN

by Donna Gerten

NCGR-Corvallis information transfer to the Germplasm Resources Information Network (GRIN) continues to become more complete. Records for *Pyrus* were loaded to GRIN last August on phenological data and disease observation, as well as some data on precocity and trunk diameters. 26,000 individual observation records were loaded representing 4 years of evaluations on these characters. Considerably more *Pyrus* data awaits data entry to dBase and uploading to GRIN.

Accessions records for the genus *Vaccinium* were updated in October '89. Inventory records for *in vitro* accessions were loaded for the first time to GRIN in December '89 for the major genera. We load GRIN data on roughly a quarterly schedule. Inventory updates, new accession records, filled orders, and new cooperator records are being loaded 5 or 6 times a year due to increasing amounts of

data.

Plant Evaluations

by Donna Gerten

The *Vaccinium* field collection is beginning to be evaluated at NCGR. Observations were recorded in October '89 for autumn leaf color. Fruit and phenological data will be recorded in 1990.

Data is being recorded on more phenological characters for *Corylus* in 89-90 than had previously been studied. Male and female bloom dates and characteristics are emphasized, along with certain nut characteristics. More specific yield characters will be taken in a year or two as the field planting matures.

Certain "one-time" phenological and fruit data for *Ribes*, such as fruit color, growth habit, thorniness, etc. are nearly complete for the established field collection. Evaluations in 1990 will concentrate on characters such as total fruit weights, soluble solids, and ripening dates.

Germplasm Enhancement

by Dr. F.J. Lawrence

Four seedling populations from open-pollinated black raspberry (*R. occidentalis*) seed collected in the Eastern U.S. were rated, primarily for vigor and productiveness. 7 selections were saved. Although seedlings of previous crosses of eastern black raspberry with western black raspberry (*R. leucodermis*) have shown some sterility, the hybrids show a potential for improved vigor and increased production.

Two 4x red raspberry selections with *R. parvifolius* in their pedigree had good fruit set and did not show mildew or leaf spot. They may be useful germplasm in the origination of Logan types with improved disease resistance, as Logan is considered susceptible to leaf spot.

Strawberry selection ORUS 4930 has been proposed for release. This selection has exhibited some cold hardiness and is a firm berry with a rich uniform internal color.

In Vitro/Cryo

by B. Reed, C. Paynter

Quarterly inventories of the 4°C cold storage collection are being used to track the survival of over 1,000 accessions. These inventories allow us to identify and repropagate accessions which have declined in storage. Studies of cold storage conditions are continuing.

Major additions to the *in vitro* collections were made this summer and fall. Over 400 *Mentha* cultures were initiated. Once propagated, all accessions will be placed in cold storage. Sixty additional *Vaccinium* clones were added to the collection and are being stored as they multiply sufficiently. Cold stored *in vitro* plants are being used to fill the increasing number of requests for *in vitro* materials.

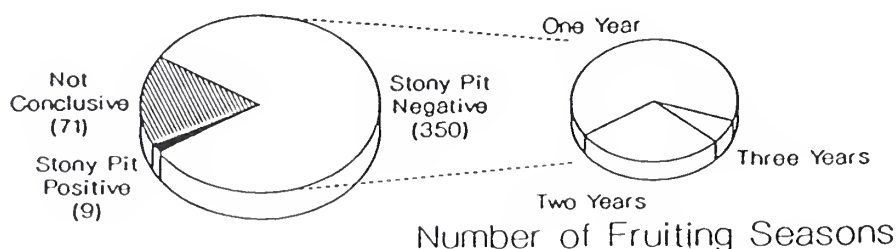
Cryopreservation screening of *in vitro* *Pyrus* and *Rubus* plants is continuing. We hope to document the variability present in response to cryopreservation in liquid nitrogen for these genera. This will enable us to store the meristems of these genera for future use.

Pear Stony Pit Virus Update

by Joseph Postman

Stony pit virus is one of the few virus diseases that can have an obvious economic effect on pear trees. Certain varieties react to this virus by producing large stone cells at the base of sunken pits in the fruit surface. In severe cases the fruits are completely deformed. Fortunately, most cultivars are tolerant to this disease and even when infected show no symptoms. Bosc is one commercial cultivar grown in the United States that is severely affected by stony pit virus. There are no quick and easy tests presently available so symptomless carriers can only be identified by using a very time consuming bioassay. Stony pit virus produces no reliable leaf or stem symptoms. Symptoms occur only in the fruit of sensitive varieties. An indicator such as Bosc

Incidence of Stony Pit Virus In NCGR Pear Accessions



must be graft inoculated, and then one must wait for the indicator plant to produce fruit. Even in fruiting trees, the symptoms do not occur throughout the tree, and do not occur every year.

We are testing for stony pit at the by grafting a Bosc limb onto each pear cultivar growing in the repository field collection. There have been three seasons of fruit on some of these Bosc grafts, and we are now able to make a tentative summary on the incidence of stony pit. A total of 421 Bosc limbs have produced fruit to date, and only 9 trees have produced stony pit symptoms. The pie chart that follows summarizes the data. Similar symptoms may be produced by other causes so there are a number of accessions listed as inconclusive.

Blueberry Scorch *Carlavirus* Detected in Corvallis

by Joseph Postman

A new disease has been spreading in the Pacific Northwest which may have a severe effect on the growth and yield of blueberry plants. Symptoms of the disease include a wilting and foliar dieback of young foliage in the spring which results in a "scorched" appearance. Symptoms may involve an entire plant, or just a single branch. Affected areas may grow new foliage later in the season, but will have no fruit. One or more viruses have been associated with this disease, and researchers in Vancouver, British Columbia have successfully produced antisera against two of these. One virus is in the *Carlavirus* group, and another is a *spherical* virus. Stuart McDonald of the Vancouver Experiment Station generously provided antisera against both of these viruses so that the NCGR *Vaccinium* collection could be screened using the ELISA test. All NCGR plants tested negative for the "sphere" virus, however several accessions from both the field, and the greenhouse collections tested positive for the "Blueberry Scorch *Carlavirus*." Most of the infected plants came to the repository from an area in Washington state where the disease is now widespread. The method of spread of this disease is not known, although an aphid vector is suspected.

Plant Patent Database at NCGR

by Joseph Postman

Proprietary rights to propagate plants are governed by three different types of patents. The Plant Variety Protection Act is for sexually reproduced plants and the Plant Patent Act is

for asexually reproduced plants. Recently, protection by the Utility Patent has been extended to both sexually and asexually propagated plants. The Utility Patent restricts the use of the plant's genes and other plant parts, as well as the propagation rights to the plant. This very restrictive patent has been used only in a few instances, and most of the utility patents have been issued for genetically engineered plants.

The United States National Plant Germplasm System (NPGS) does not restrict the distribution of patented material from germplasm repositories for research purposes. Known patents are indicated when plants are distributed. Donors should understand that germplasm provided to the NPGS is available for worldwide distribution. The recipient is responsible for complying with patent restrictions.

To collect plant patent information, a search of the CASSIS database was performed for all fruit and nut crops, and other miscellaneous crops including mint and hops. Only about 7000 plant patents have been issued, and the majority of these are for ornamentals such as roses. When searching by crop classification, CASSIS only lists patents issued since 1977. The information obtained from CASSIS was combined with information previously collected, and a database was constructed on our own computer system to store plant patent information. We are in the process of obtaining copies of patent documents for our genera. The following table lists the number of patented plants identified for NCGR-Corvallis genera through about September, 1989, and the number of patented accessions known to be present at the repository:

Crop	Number of	Patented
	Plant Patents	Accessions
	Identified	at NCGR
<i>Fragaria</i> (Strawberry)	112	8
<i>Humulus</i> (Hop)	1	0
<i>Mentha</i> (Mint)	9	0
<i>Pyrus</i> (Pear)	52	25
<i>Ribes</i> (Currant-Gooseberry)	1	0
<i>Rubus</i> (Brambles)	40	9
<i>Vaccinium</i> (Blueberry)	4	1

At the time a patent is issued, many plants have not been given a cultivar name and are simply listed as "Strawberry Plant" or "Pear Tree". Many of these have subsequently been

given cultivar names and may be present at NCGR, but it will take some additional research to identify these. A plant patent is valid for 17 years, and patents have already expired for many of the patented clones housed at the repository.

Some have expressed concern that proprietary rights could interfere with the free flow of germplasm. A recent workshop addressed some of the issues of plant patenting. (See 1989, Diversity 5(2):35-37)

Curators Corner

by Kim Hummer

In these financially burdened times, the trend in plant breeding along with other previously governmentally supported activities is shifting from the public to the private sector. In large economically important crops numbers of private breeders are increasing but maybe not enough. In crops having smaller dollar figure returns, such as temperate fruit and nut crops, not as many private companies seem to be rallying to take up where federal and state programs have been cut. Programs with high biotechnology components are taking the place of classical plant breeding. Biotechnology has not yet provided real answers to practical questions of increased yield, increased pest resistance, or improved varieties in the way that classical breeding has served American agriculture over the years. While some enthusiastic private individuals continue to develop unique fruit varieties in their back yards, regional interests and national markets will not be addressed in the near future if this trend continues.

American agriculture may soon be farmed out to foreign interests like American industry already has. We will eat our 'Fuji' apple pie and wonder what "made in America" really means.

Posters and Oral Presentations

Hummer, Kim. Bloom sequence of *Pyrus* germplasm in Corvallis, OR. Annual meeting of the American Society for Horticultural Science, Tulsa, OK. July-August 1989.

Hummer, Kim. *Rubus* germplasm at the National Clonal Germplasm Repository. 5th International *Rubus* and *Ribes* Symposium, Corvallis, OR. 30 June 1989.

Hummer, Kim. Germplasm importation of small fruits/regulations and procedures 1989. 40th Annual Western Small Fruit Pest and Disease Conference, Welches, OR. 11 January 1989.

Postman, Joseph. Pear germplasm at the National Clonal Germplasm Repository. Home Orchard Society, Portland, OR. October 1989.

Postman, Joseph. Detection of viruses by ELISA following sample storage. 40th Annual Western Small Fruits Pest Conference, Welches, OR. January 1989.

Reed, B.M. 1990. Survival of in vitro-grown apical meristems of *Pyrus* following cryopreservation. HortScience, January. Gordon conference on Plant Temperature Stress. January 1989.

Reed, B.M. 1989. Effect of cold hardening and cooling rate on the survival of apical meristems of *Vaccinium* frozen in liquid nitrogen. American Society of Plant Physiologists, Toronto. July 1989.

Publications

James, N. 1990. Public plant breeding programs of the United States in 1989. Diversity, spring issue 1990. (In press)

Reed, B.M. 1989. The effect of cold hardening and cooling rate on the survival of apical meristems of *Vaccinium* species frozen in liquid nitrogen. CryoLetters 10:315-322.

Reed, B.M. 1990. Survival of in vitro-grown apical meristems of *Pyrus* following cryopreservation. HortScience, January. (In Press)

Postman, Joseph 1990. Incidence of virus diseases in U.S. National Clonal Germplasm Repository *Rubus* and *Ribes* Collections. 5th International *Rubus-Ribes* Symposium, July 1989. Acta Horticulture, (in press).

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